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to devote their full time to the work of the Committee, their salaries for one year to be paid out of the fund mentioned. There is also ample provision for stenographic and other clerical help, and for printing, stationery, and postage, as well as for travelling expenses. It is hoped that a more extended account of the proposed work of the Committee published in the next issue of the MONTHLY. By that time, also, the organization of the Committee under the new plan should have been effected.

FOURTH ANNUAL MEETING OF THE OHIO SECTION.

The fourth annual meeting of the Ohio Section of the Mathematical Association of America was held at the Ohio State University, Columbus, on Friday, April 18, 1919, in connection with the meetings of the Ohio College Association. Professor C. N. Moore occupied the chair, being relieved by Professor K. D. Swartzel for an interval.

The following thirty-eight persons were registered, all but the last ten being members of the Association:

R. B. Allen, Kenyon College; W. E. Anderson, Miami University; G. N. Armstrong, Ohio Wesleyan University; C. L. Arnold, Ohio State University; C. B. Austin, Ohio Wesleyan University; Grace M. Bareis, Ohio State University; Mrs. W. E. Beckwith, Western Reserve University; R. D. Bohannon, Ohio State University; R. L. Borger, Ohio University; J. B. Brandeberry, Toledo University; A. G. Caris, Defiance College; T. M. Focke, Case School of Applied Science; M. E. Graber, Heidelberg University; Harris Hancock, University of Cincinnati; William Hoover, Columbus; Emma L. Konantz, Ohio Wesleyan University; H. W. Kuhn, Ohio State University; C. N. Moore, University of Cincinnati; C. C. Morris, Ohio State University; Anna H. Palmié, Western Reserve College for Women; S. E. Rasor, Ohio State University; Hortense Rickard, Ohio State University; W. G. Simon, Adelbert College; S. A. Singer, Capital University; K. D. Swartzel, Ohio State University; R. B. Wildermuth, Capital University; F. B. Wiley, Denison University; D. T. Wilson, Case School of Applied Science. Non-members: H. M. Beatty, Ohio State University; W. S. Beckwith, Ohio Northern University; Clara F. Brumbach, Denison University; C. A. Hahn, Otterbein College; G. W. McCoard, Ohio State University; F. W. Parsons, Ohio Northern University; Anna B. Peckham, Denison University; F. J. Shollenberger, Mt. Union College; C. H. Skinner, Ohio Wesleyan University; S. E. Slocum, University of Cincinnati.

The following program, slightly changed in order, was carried out as arranged by the executive committee:

General theme: Mathematics and Warfare.

1. Chairman's Address: The rôle of mathematics in world progress by Professor C. N. MOORE, University of Cincinnati.

2. The mathematical features of navigation by Professor D. T. WILSON, Case School of Applied Science.
3. Discussion of the preceding by Professor W. E. ANDERSON, Miami University.

Business and Intermission.

4. Ballistics as applied mathematics by Professor M. E. GRABER, Heidelberg University.
5. The mathematics of aviation by Professor S. E. SLOCUM, University of Cincinnati. (Introduced by Professor C. N. Moore.)

About twenty of those present dined together at the Ohio Union in the evening. A recess was taken during the evening program to attend the lecture given before the coöperating societies by the representative of the Carnegie Foundation, on "The Pension Problem for College Teachers." Many remained over Saturday to attend meetings of the Ohio College Association.

ABSTRACT OF PAPERS.

1. In speaking of the rôle of mathematics in world progress, Professor Moore said that the great importance of mathematics in various war activities was due to its extreme usefulness in many technical and scientific labors. Hence, the war record of mathematics shows in general that knowledge of this subject is of equal value in connection with the tasks of peace. In addition to this, a number of uses of mathematics during the war, such as the application of mathematical analysis to the study of wounds, may be regarded as positive contributions to world progress. This application of mathematics, together with other recent applications in such fields as biology, sociology and economics, illustrates the fact that the domain of usefulness of mathematics is as wide as the domain of science. It is the duty of mathematicians to make some effort to bring this fact home to the general public and to strive to make wider use of the applications of mathematics in connection with their courses. In this way many more college students will be induced to continue their mathematical studies through a first course in calculus, and the better trained workers in other fields will thus be able to discover many new applications of mathematics.

2. Mathematics is essential to the navigator in determining the angle of departure, in getting the details of his course, and in the maintenance of his course. The track is usually either a loxodrome or a great circle. For the loxodrome the angle of departure and distance between ports are computed from the principles of the Mercator projections. For a great circle these are computed from spherical triangles of which the vertices are the two ports, the pole and the vertex of the arc. In order to maintain his course, the navigator must be able to determine his position at sea by the principles of practical astronomy.

3. Professor Anderson noted that the principles enunciated in the theory of navigation may be utilized in creating an interest in the applications of mathematics, and thus in mathematics itself. The astronomical principles should be used as a means of creating an interest in astronomy, which should be made

available to the great majority of our students. The apparently complex formulæ of spherical trigonometry can be shown to be reducible to three simple formulæ, thus illustrating the fact that the fabric of mathematical structure is exceedingly simple, failure to grasp which fact is the source of much of the student's difficulty in his mathematical work.

4. In this paper the mathematical foundations of interior and exterior ballistics were outlined by Professor Graber. The applications of mathematics to the theory of explosives, principal stresses and strains and the design of artillery were mentioned and a typical case of design considered. Sarau's modified formulae of design were given and their application indicated. Then followed a comparison of the Mayevski velocity-resistance graph and the corresponding graph embodying the latest French results. An analytic expression was exhibited for the velocity-resistance relation between the velocities 1700 ft./sec. and 700 ft./sec. In the field of rational exterior ballistics, Siacci's method was developed and a graphic solution of problems in direct fire explained from constructed graphs. Graphs of different trajectories were also exhibited with their corresponding calculated elements.

5. The purpose of the paper by Professor Slocum was to call attention to the possibilities of aëronautics as a field of mathematical research. Thirty years ago there were authoritative proofs that mechanical flight was impossible, and it was only fifteen years ago that this was disproved by actual demonstration. In this brief period, aviation has attained a remarkable practical development and its theoretical development must follow in the near future. The present content of aëronautics was outlined under three heads: experimental, theoretical, and structural. In the second of these, the extent of mathematical analysis was indicated, and the need for an extension of theory to supplement practice pointed out. Attention was called to the future possibilities of aviation, and the duty and privilege of mathematicians to aid in the conquest of the air.

At the Friday evening round table, held in the Ohio Union and attended by twenty-three persons, the discussion, widely participated in, centered upon experience and lessons from S. A. T. C. work, supervised study, and war activities. Professor Swartzel spoke of his experiences as an inspector of S. A. T. C. work. Professor Hancock gave results of extensive mathematics tests given S. A. T. C. applicants at the University of Cincinnati, which indicated very inadequate preparation on the part of the men.

The following were elected as officers for 1919-20:

Chairman: R. L. BORGER, Ohio University.

Secretary-Treasurer: G. N. ARMSTRONG, Ohio Wesleyan University.

Third member of the Executive Committee: S. E. RASOR, Ohio State University.

G. N. ARMSTRONG, *Secretary-Treasurer.*